

Appln. No. 10/709,175  
Docket No. 146442/GEM-0120

### **REMARKS / ARGUMENTS**

#### **Status of Claims**

Claims 1-14 and 35 are pending in the application and stand rejected. Applicant has canceled Claims 2 and 9, and has amended Claims 1, 8 and 35, and added new Claim 36, leaving Claims 1, 3-8, 10-14, and 35-36 for consideration upon entry of the present Amendment.

Applicant respectfully submits that the rejections under 35 U.S.C. §102(b) and (e) have been traversed, that no new matter has been entered, and that the application is in condition for allowance.

#### **Rejections Under 35 U.S.C. §102**

Claim 1 stands rejected under 35 U.S.C. §102(e) as being anticipated by Farnworth et al. (U.S. Patent No. 6,710,612, hereinafter Farnworth).

Claims 1, and 8-14 stand rejected under 35 U.S.C. §102(b) as being anticipated by Kawakami et al. (U.S. Patent No. 6,496,162, hereinafter Kawakami).

Claims 1-7, and 9-10 stand rejected under 35 U.S.C. §102(b) as being anticipated by Akram et al. (U.S. Patent No. 6,313,650, hereinafter Akram).

Claim 35 stands rejected under 35 U.S.C. §102(b) as being anticipated by Degani et al. (U.S. Patent No. 6,100,475, hereinafter Degani).

Applicant traverses these rejections for the following reasons.

Applicant respectfully submits that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, *in a single prior art reference.*" *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, "[t]he identical invention must be shown in as complete detail as is contained in the \*\*\* claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Furthermore, the single source must disclose all of the claimed elements "arranged as in the claim." *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d

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707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. Titanium Metals Corp. v. Banner, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

Regarding Claims 1, 3-8, and 10-14

Applicant has amended independent Claim 1 to now recite, inter alia,

"...a plurality of *electrically conductive projections*... the second layer comprising a diode array having *a plurality of backlit photodiodes* in electrical communication with the plurality of projections; and

an electrically conductive connecting material disposed at the plurality of cavities such that the connecting material *non-separably* connects the plurality of projections to the respective plurality of cavities, each of *the plurality of cavities being configured to constrain the connecting material* disposed thereat from outward flow;

wherein the plurality of cavities are formed having *a depth d* in the first interface surface;

wherein the first interface surface is disposed apart from the second interface surface by *a gap g*; and

wherein the plurality of projections have *a length h* that is *equal to or less than the sum of the depth d and the gap g*, such that *the connecting material bridges the distance defined by (d+g-h)*."

Dependent claims inherit all of the limitations of the parent claim.

Here, Applicant has incorporated language from Claims 2, 8 and 9 into Claim 1, canceled Claims 2 and 9, and amended Claim 8 to eliminate repetitive language.

Regarding Farnworth and Claim 1 Specifically, The Examiner comments that because the originally claimed connection could be separable or non-separable, and that the originally claimed connection of the projections to the cavities is not claimed as being non-separable, the rejection under Farnworth is deemed to be correct. Paper 03152005, page 5.

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Applicant has amended Claim 1 to now include the limitation "non-separably", which finds support in the specification as originally filed at Paragraph [0012] where Applicant discloses "connecting material 130... the heating and cooling of a solder, via a reflow and solidification process." No new matter has been added.

For at least this reason, Applicant submits that Farnworth does not disclose each and every element of the claimed invention arranged as claimed, and being absent anticipatory disclosure in Farnworth of each and every element of the claimed invention arranged as in the claim, Farnworth cannot be anticipatory.

Regarding Kawakami and Claims 1 and 8-14 specifically, the Examiner alleges anticipation of each and every element arranged as claimed. Paper 03152005, pages 2-3.

Applicant respectfully disagrees.

In view of the amendment to Claim 1, Applicant submits that Kawakami is absent disclosure of:

"...a plurality of *electrically conductive projections*... the second layer comprising a diode array having *a plurality of backlit photodiodes* in electrical communication with the plurality of projections; and

an electrically conductive connecting material disposed at the plurality of cavities such that the connecting material *non-separably* connects the plurality of projections to the respective plurality of cavities, each of *the plurality of cavities being configured to constrain the connecting material* disposed thereat from outward flow;

wherein the plurality of cavities are formed having *a depth d* in the first interface surface;

wherein the first interface surface is disposed apart from the second interface surface by *a gap g*; and

wherein the plurality of projections have *a length h* that is *equal to or less than the sum of the depth d and the gap g*, such that *the connecting material bridges the distance defined by (d+g-h)*."

As amended, Applicant finds Kawakami to be absent disclosure of a plurality of *backlit photodiodes*, projections *non-separably* connected to the cavities, the *connecting*

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*material being constrained* by the cavities from outward flow, and the plurality of projections having a length  $h$  that is *equal to or less than the sum of the depth  $d$  and the gap  $g$* , such that *the connecting material bridges the distance defined by  $(d+g-h)$* .

Furthermore, the Examiner alleges that Kawakami discloses:

"...a second layer having a second interface surface and a plurality of projections disposed at the second interface surface, *wherein the plurality of projections are aligned with and disposed at the plurality of cavities*; and

an electrically conductive connecting material *disposed at the plurality of cavities* such that the connecting material *connects the plurality of projections to the respective plurality of cavities...*" (Emphasis added). Paper 03-152005, page 3.

In making this allegation, the Examiner references Kawakami stating "...the thermally fused connection of one (2) of the substrates to the other (30) using projections (31) and through holes is inherently performed by welding the solder projections to metal plated vias (through holes) (*For example US 6,100,475*)."

Paper 03-152005, page 5.

Emphasis added.

At the outset, Applicant notes that the Examiner appears to be relying on both Kawakami and Degani (U.S. Patent No. 6,100,475) to make this anticipation rejection, which Applicant respectfully submits is improper for an anticipation rejection. Accordingly, Applicant looks to Kawakami alone for purposes of this anticipation rejection.

Applicant submits that the Examiner's reference to projections (31) is totally inapposite to the claimed invention. In Kawakami, projections (31) are not disclosed as being electrically conductive, are not disclosed being aligned with and disposed at the plurality of cavities, and are not disclosed being in electrical communication with a plurality of backlit photodiodes.

Contrary to the Examiner's allegation, Applicant finds the Kawakami projections (31) to be fixation posts disposed between adjacent lenses (3) for the purpose of fixing substrate (2) to case (30). Col. 3 lines 49-57, Figure 4A.

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If Applicant were to accept the Examiner's interpretation of Kawakami, then it appears that the projections (31) would electrically short out the adjacent lenses (3), which is contrary to Applicant's claimed invention.

Furthermore, and specifically regarding Claim 8, the Examiner alleges that Kawakami discloses backlit photodiodes in electrical communication with the plurality of projections. Paper 03152005, page 3.

Applicant respectfully disagrees.

Not only does Applicant find Kawakami to disclose LED's as opposed to backlit photodiodes (see Abstract for example), but Applicant also finds Kawakami to be absent any disclosure of the LED's being in electrical communication with the plurality of projections (31). As previously noted, if the LED's were in electrical communication with the plurality of projections (31), which are disposed between adjacent LED's (see Figure 4A for example), then it would appear that the adjacent LED's would be electrically shorted, which is contrary to the claimed invention.

For at least these reasons, Applicant submits that Kawakami does not disclose each and every element of the claimed invention arranged as claimed, and being absent anticipatory disclosure in Kawakami of each and every element of the claimed invention arranged as in the claim, Kawakami cannot be anticipatory.

Regarding Claim 11 specifically, the Examiner references Ex parte Masham, 2 USPQ2d 1647 (1987), stating that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Paper 03152005, page 3.

In making this rejection, it appears that the Examiner disregards the structural limitation of the assembly comprising *a light detector*, which when taken in combination with the other elements from which Claim 11 depends, discloses elements not found in a single art of reference made by the Examiner.

Regarding Akram and Claims 1-7, 9 and 10 specifically, the Examiner alleges that Akram discloses each and every element of the invention arranged as claimed, and

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specifically discloses depth  $d$ , gap  $g$  and length  $h$ , where the plurality of projections have a length  $h$  that is equal to or less than the sum of the depth  $d$  and the gap  $g$ . Paper 03152005, page 4.

Applicant respectfully disagrees.

Applicant finds Akram to be directed to an insert testing system (Title and Abstract), and to be completely absent any disclosure of *the plurality of cavities being formed having a depth  $d$ ... the first interface surface being disposed apart from the second interface surface by a gap  $g$ ... and, the plurality of projections having a length  $h$  that is equal to or less than the sum of the depth  $d$  and the gap  $g$ , such that the connecting material bridges the distance defined by  $(d+g-h)$ .*

Applicant finds no disclosure in Akram of a depth  $d$ , a gap  $g$ , and a length  $h$ , and no disclosure of the structural relationship therebetween.

For at least this reason, Applicant submits that Akram does not disclose each and every element of the claimed invention arranged as claimed, and being absent anticipatory disclosure in Akram of each and every element of the claimed invention arranged as in the claim, Akram cannot be anticipatory.

Dependent claims inherit all of the limitations of the parent claim and any intervening claim.

**Regarding the Examiner's Reference to In re Yount, 36 C.C.P.A. (Patents) 775, 171 F.2d 317, 80 USPQ 141 and In re Dalley, 149 USPQ 47 9CCPA 1976)**

Regarding Claims 3-6 and 12-14 specifically, the Examiner references In re Yount, 36 C.C.P.A. (Patents) 775, 171 F.2d 317, 80 USPQ 141, and In re Dailey, 149 USPQ 47 (CCPA 1976), stating that the size of an article under consideration is not ordinarily a matter of invention, and that Applicant has presented no arguments that convincingly show the particular geometry to be significant. (Paper 03152005, pages 3 and 4).

Applicant respectfully disagrees.

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In the response to office action dated January 12, 2005, Applicant indicated that some embodiments of the invention may include some of the following advantages: a **high packing density** of backlit photodiodes on the ceramic substrate with a small spacing therebetween; **effective containment** of the conductive connecting material to prevent shorting between adjacent diodes; and, stud bumps of a backlit photodiode having a **small pitch** with respect to the dimension of the photodiode. Paragraph [0024].

As such, Applicant specifically enumerated advantages of the invention that **solve problems relating to a high packing density of backlit photodiodes on a ceramic substrate where shorting between adjacent diodes may be problematic** that one skilled in the art may not necessarily recognize the claimed solution to, thereby adding patentable weight to the claimed limitations.

Accordingly, Applicant submits that the application as filed does show the particular geometry to be significant.

Regarding Claim 35

Applicant has amended Claim 35 to now recite, inter alia,

“...a first layer having a **plurality of pockets**;

a second layer comprising a diode array having a plurality of **backlit photodiodes in electrical communication with the plurality of projections**, wherein the plurality of projections are aligned with and disposed at the plurality of pockets with a **defined distance therebetween**; and

an electrically conductive connecting material disposed at the plurality of pockets such that the plurality of projections are electrically and **non-separably bonded** to the respective plurality of pockets via the electrically conductive connecting material;

wherein the conductive connecting material **bridges the defined distance**; and

wherein each of the plurality of pockets are configured to **constrain the connecting material** disposed thereat **from outward flow**.”

No new matter has been added as antecedent support may be found in the claims and specification as originally filed.

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In view of the foregoing amendment and remarks, Applicant submits that none of the references disclose each and every element of the claimed invention arranged as claimed, and therefore cannot be anticipatory.

In light of the forgoing, Applicant respectfully submits that the Examiner's rejections under §102(b) and (e) have been traversed, and respectfully requests that the Examiner reconsider and withdraw these rejections.

**Regarding New Claim 36**

Applicant has added new Claim 36, which is direct to subject matter similar to that of Claims 1 and 35, but in alternative language. No new matter has been added as antecedent support may be found in the specification, claims and figures as originally filed.

In view of the previous discussion relating to Claims 1 and 35, Applicant respectfully submits that the References do not disclose, teach or suggest the claimed invention, and do not motivate one to arrive at the claimed invention.

Accordingly, Applicant submits that new Claim 36 is directed to allowable subject and respectfully requests entry and notice of allowance thereof.



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The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 07-0845.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above identified Deposit Account.

Respectfully submitted,

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